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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/484,376	01/14/2000	Oved Shlomo Frank Zucker	APTI:027	9632

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EXAMINER

LEE, DIANE I

ART UNIT

PAPER NUMBER

2876

DATE MAILED: 05/20/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/484,376

Applicant(s)

ZUCKER, OVED SHLOMO FRANK

Examiner

Diane I. Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 January 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_ 6) ☐ Other: \_\_\_\_

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### DETAILED ACTION

1. Claims 1-19 are presented for examination.

#### *Drawings*

2. Figure 6 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated for the following reason(s):

Applicant discloses that a conventional diode (i.e., C30808E diode, as shown in figure 6, is already manufactured by EG&G Canada at the time of the Applicant filed the instant application), can be modified to carry 20 to 100A for about 50 ns, wherein the electrode structure of C30808E diode manufactured by EG&G Canada includes a plurality of strips formed on a surface of the photoconductive diode, and the strips have a width of about 10 $\mu$ m, a thickness of 0.25-10 $\mu$ m, are separated by gaps having a width of about 40 $\mu$ m, and can carry at least 20A for 50 ns (see page 8, lines 17+ and figure 6). See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

#### *Claim Objections*

3. Claims 4 and 19 are objected to because of the following informalities:
  - (a) Re claim 4, line 3: "a photoconductor" should be changed to --said photoconductor--;
  - (b) Re claim 4, line 1: "a photoconductor" should be changed to --said photoconductor--; and
  - (c) Re claim 19, lines 1-2: "a a of" should be deleted.

Appropriate correction is required.

#### *Claim Rejections - 35 USC § 112*

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 4-17 and 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claim 4: Lines 1+ read, "the power circuit having at least one leg including a pair of transistors (i.e., there are two transistors in the power circuit), .... wherein activation of the photoconductor turns on the transistor". It is unclear as to which transistor of the pair of transistor is activated, i.e., is it one of the transistor of the pair or two transistors? Therefore, claim 4 and claims depend therefrom, claims 5-17 and 19, are vague and indefinite.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-3 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zucker et al. [US 6,218,682-referred as Zucker].

Re claim 1: Zucker discloses an apparatus comprising:

an optical triggering circuit (optical switch 428) at a first location of the apparatus, wherein the optical triggering circuit generates an optical trigger signal (see col. 10, lines 22+ and figure 4b);

a power circuit (a high voltage source 430) located at a second location of the apparatus remote from the first location, wherein the power circuit includes a light controlled thyristor (LDT) 100 that is responsive to the optical trigger signal generated by the optical triggering circuit (see col. 4, lines 40+);

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a signal transmission connection (i.e., the figure 4b shows the signal connection between the optical triggering circuit and the power circuit but not specifically identified in the figure) coupling the optical triggering circuit to the power circuit; and

wherein the power circuit is directly driven by the transmission of the optical trigger signal from the optical triggering circuit to the power circuit via the optical transmission connection.

Zucker does not specifically teach the power circuit includes a photoconductor and the optical cable coupling the optical triggering circuit to the power circuit.

However, Zucker teaches the power circuit having a light controlled thyristor (LDT) 100 which provides an equivalent claimed function of the photoconductor (i.e., a switch that is activated in response to the optical trigger signal generated by the optical triggering circuit), and the signal transmission connection that providing the signal connection between the optical triggering circuit and the power circuit also provides an equivalent claimed function of the an optical cable coupling the optical triggering circuit to the power circuit. Therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to recognize that the apparatus of Zucker could be modified with other switching or triggering means so long as it provides an equivalent function and result. Accordingly, it would have been obvious expedient.

Re claim 2: the apparatus further comprising a control processor 442 coupled to the optical triggering circuit, wherein the optical triggering circuit is responsive to receipt of a command signal from the control processor to generate the optical trigger signal (see col. 4, lines 38+; col. 10, lines 24+; and figure 4B).

Re claim 3: Zucker teaches that the optical switching system is utilized in a motor control and switching power supply (see col. 4, lines 37+), and the optical triggering circuit is coupled to the high voltage source 430 which serves as applicant's claimed DC motor (see col. 10, lines 10+)

Re claim 18: Zucker teaches that the optical triggering circuit utilizes a laser diode to generate the optical triggering circuit (see col. 10, lines 46+).

8. Claims 4-6 (as best understood), and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zucker in view of Beeston et al. [US 4,485,434-referred as Beeston]. The teachings of Zucker have been discussed above.

Re claims 4-6 and claims 16-17: Although Zucker teaches the photoconductor comprises a photoconductivity controlled channel transistor (see col. 9, lines 57+), Zucker fails to teach or fairly suggest the power circuit having at least one leg including a pair of transistors, each transistor including a base coupled in series to a photoconductor, wherein activation of the photoconductor turns on the transistor.

Beeston teaches the power circuit having at least one leg including a pair of transistors 37, 38, each transistor including a base coupled in series to a shunt photoconductor (opto-isolator 46, 45 having a modified electrode structure) wherein activation of the photoconductor turns on the transistor (see col. 4, lines 26+ and figure 1b).

It would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to incorporate the power circuit of Beeston in the apparatus of Zucker in order to provide a simplified power circuit to control the power circuit.

9. Claims 7-15 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zucker as modified by Beeston as applied to claim 4 above, and further in view of the applicant's admitted prior art of the record. The teachings of Zucker as modified by Beeston have been discussed above.

Zucker as modified by Beeston fails to teach the electrode structure including a plurality of strips formed on a surface of the photoconductive diode, wherein the strips have a width of about 10 $\mu$ m, a

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thickness of between 0.25-10 $\mu$ m, are separated by gaps having a width of about 40 $\mu$ m, and can carry at least 20A for 50 ns.

Applicant admitted that a conventional diode can be modified to achieve the operational performance required of the system architecture, namely, a C30808E diode manufactured by EG&G Canada can be modified to carry 20 to 100A for about 50 ns, wherein the electrode structure of C30808E diode manufactured by EG&G Canada includes a plurality of strips formed on a surface of the photoconductive diode, and the strips have a width of about 10 $\mu$ m, a thickness of 0.25-10 $\mu$ m, are separated by gaps having a width of about 40 $\mu$ m, and can carry at least 20A for 50 ns, (see page 8, lines 17+ and figure 6).

It would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to incorporate the conventional modifiable diode (i.e., such as a C30808E diode manufactured by EG&G Canada) in the power circuit of Zucker as modified by Beeston in order to achieve the desired operational performance required of the system architecture.

### *Conclusion*

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Stobbe et al. [US 4,126,819] and Ikeda et al. [US 5,323,305] teaches the power circuit having at least one leg including a pair of transistors, each transistor including a base coupled in series to a photoconductor, wherein activation of the photoconductor turns on the transistor.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Diane I. Lee whose telephone number is 703-306-3427. The examiner can normally be reached on Monday through Friday from 6:30 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael G. Lee can be reached on 703-305-3503. The fax phone numbers for the organization where this

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application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



Diane I. Lee  
Examiner  
Art Unit 2876

D.L.  
May 16, 2002